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OFFICE OF EXPERIMENT STATIONS—FARMERS' INSTITUTE LECTURE 13.

A. C. TRUE, Director.

SYLLABUS OF ILLUSTRATED LECTURE
ON
THE PEANUT:
ITS CULTURE AND USES.

BY

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LIST OF ILLUSTRATED LECTURES.

- Farmers' Institute Lecture 1. Syllabus of Illustrated Lecture on the Care of Milk, accompanied with 44 lantern slides. By R. A. Pearson. Pp. 12. 1904.
- Farmers' Institute Lecture 2. Syllabus of Illustrated Lecture on Potato Diseases and Their Treatment, accompanied with 47 lantern slides. By F. C. Stewart and H. J. Eustace. Pp. 30. 1904.
- Farmers' Institute Lecture 3. Syllabus of Illustrated Lecture on Acid Soils, accompanied with 53 lantern slides. By H. J. Wheeler. Pp. 28. 1904.
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- Farmers' Institute Lecture 12. Syllabus of Illustrated Lecture on Farm Homes, accompanied with 53 lantern slides. By John Hamilton, Farmers' Institute Specialist, Office of Experiment Stations, and Geo. Nox McCain, Philadelphia, Pa. Pp. 25. 1912.

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PREFATORY NOTE.

This syllabus of a lecture upon The Peanut: Its Culture and Uses, by W. R. Beattie, assistant horticulturist, Bureau of Plant Industry of this department, was prepared in cooperation with that bureau, and is accompanied by 50 views illustrating the topic. The syllabus and views have been prepared for the purpose of aiding farmers' institute lecturers in their presentation of this subject before institute audiences.

The numbers in the margins of the pages of the syllabus refer to similar numbers on the lantern slides and to their legends as given in the Appendix.

In order that those using the lecture may have opportunity to acquaint themselves with the subject more fully, references to literature are given in the Appendix.

JOHN HAMILTON,
Farmers' Institute Specialist.

Recommended for publication.

A. C. TRUE, *Director.*

Publication authorized. .

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., August 18, 1911.

THE PEANUT: ITS CULTURE AND USES.

By W. R. BEATTIE.

INTRODUCTION.

View.

Very little is known regarding the early history of the peanut in the United States except that it was brought into the country during the period of slave importation and became established along the James River in Virginia. It is not until after the Civil War that we find any record of peanuts becoming a commercial crop, and then only on a small scale. Prior to this time peanuts were grown in gardens for home use, and the nuts when parched were considered a great treat by the children. Soon the value of peanuts as a money crop was recognized and farmers began growing an acre or two for the market, and upon this beginning has been built an industry that represents ten or twelve millions of dollars annually. During the early days of the peanut industry only one or two varieties were recognized, those having the largest pods being known as "Virginians" and the smaller podded sorts as "Africans." Soon the farmers observed that among the large-pod variety there were certain plants that were of a more compact or bunch habit than the general crop, which spread or ran upon the ground; also that these bunch plants produced larger pods than the runner type. Accordingly the two sorts were separated, and the names of "Virginia Bunch" and "Virginia Runner" given them.

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The habits of the peanut render it especially adapted to cultivation on the sandy soils throughout the Southern States, and the wide range of uses to which it may be put makes it a desirable addition to our list of farm crops. During past years the greater part of the commercial peanut crop has been produced in Virginia, North Carolina, South Carolina, Georgia, and Tennessee. With the boll weevil injuring the cotton crop of the Southwestern States the peanut promises to become an important money crop and a part of the regular farm rotation of this section. In many cases the peanut has proven fully as profitable as any other farm crop. The production of

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View.

peanuts has not kept pace with the increased demand, and there is little danger, for the present at least, of overstocking the market. Spanish peanuts can be grown for 2½ cents a pound, and when the general market becomes supplied the oil mills can handle the surplus, making therefrom one of the finest cooking oils that can be produced. The cake resulting from the manufacture of oil is valuable for stock feeding and fertilizer. There is always the opportunity to convert peanuts into pork that will bring fancy prices. The famous Smithfield hams and bacon, which sell at from 30 to 40 cents a pound, are made from hogs that are partly fed on peanuts. All kinds of live stock will eat and thrive on peanuts and peanut hay.

3

The peanut belongs to the same family of plants as do the clovers, alfalfa, beans, and peas, but has the peculiar habit of developing its seed underground instead of on top, as do most of the legumes. During the early days when peanuts were first cultivated it was thought necessary to cover the blossoms with soil in order to secure well-filled pods. It is only necessary, however, that there should be a bed of loose soil surrounding the plants and they will then care for themselves. The blossoms of the peanut appear above ground, shooting out from where the leaf joins the stem, and after fertilization takes place the flower withers and the little stem or peg elongates and pushes down into the earth, where the pod develops. This habit of the peanut has an important bearing upon the production of the crop in that peanuts should be planted only upon loose, sandy soils, and the soil must be well cultivated and loose in order that the pegs may enter the soil and form pods.

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In common with other legumes the peanut has the power, through the agency of bacteria upon its roots, to draw the nitrogen from the air and not only use it for its own growth but to store it for the use of other plants as well. An illustration of this may be had by pulling up a peanut plant and noting the immense number of nitrogen-gathering nodules upon its roots.

THE SOIL AND ITS PREPARATION.

Peanuts thrive best on a rather loose, sandy loam soil, such as is found in abundance throughout the Southern States. The soil should be well drained, or what is ordinarily termed a "warm" soil. Peanuts can be grown on the heavier alluvial soils, but are easier to cultivate and mature better on the

light, sandy loam soils. It will pay to prepare the land for peanuts in a most thorough manner, and much of the difficulty in keeping the crop clean will be avoided by harrowing or disking the land two or three times before planting. The Spanish variety may be grown on much heavier land than the Virginia Bunch or Runner.

CROP ROTATION IN PEANUT CULTURE.

Peanuts should not be grown exclusively on any farm, but in rotation with other crops. Peanuts are adapted to growing in a system with corn, cowpeas, oats, cotton, and Irish potatoes, the cropping arrangement being made to conform to local requirements. The crop of peanuts should invariably follow some crop that has been kept cultivated and reasonably clean, as this decreases the labor required to keep the weeds under control.

When fitting land for peanuts it should be plowed about the same depth as for corn, broadcast plowing being preferable to bedding. If the land has been in corn the previous season it should be plowed in ample time to allow the materials that are turned under to thoroughly decay before planting time. Some growers prefer to bed the land and then drag down almost level before planting, but on the whole it is better to keep the surface smooth and then work the soil toward the rows in cultivating.

FERTILIZERS REQUIRED BY PEANUTS.

Commercial fertilizers, if any are used, should be applied about the time the land is given its last harrowing before planting. A crop of 60 bushels of peanuts will require about 85 pounds of nitrogen, 15 pounds of phosphoric acid, 32 pounds of potash, and 48 pounds of lime. It would be difficult to secure a fertilizer that would supply these elements in the above proportions; in fact, it would not be profitable to return all of these elements, especially the nitrogen, to the soil by means of commercial fertilizers. A fertilizer containing about 2 per cent nitrogen, 8 per cent phosphoric acid, and 8 per cent potash is recommended for peanuts, and this may profitably be applied at the rate of 200 to 400 pounds to the acre. This will add the necessary phosphoric acid and potash to grow a crop, but only a small part of the nitrogen; the remaining nitrogen can be secured more cheaply through the agency of cowpeas, crimson clover, and the peanuts themselves if they are properly handled.

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View.

Stable manure is not a desirable fertilizer for peanuts unless applied about a year in advance. The objections to manure are that it carries with it too many weed seeds and also produces a rank growth of peanut vine at the expense of the peanuts.

- 13 Lime is essential to the proper ripening of the peanuts, and where not already abundantly present should be applied to the soil. Marl is often used as a substitute for lime, being hauled and spread upon the land during the winter months. Ordinary lime may be used at the rate of 300 to 600 pounds to the acre on land being planted to peanuts. In many cases the soils of the Southern States are pretty well supplied with lime. Where there is any doubt about the matter lime should be applied to a portion of the field at least and its influence upon the yield and ripening of the peanuts observed. The lime should be applied to the surface after plowing and while fitting the land for planting.

Wood ashes are an excellent fertilizer for peanuts, as they contain both potash and lime. Unfortunately, the supply of wood ashes is quite limited and only small quantities may be secured. Where obtainable, unleached wood ashes may be applied to peanut land at a rate not exceeding 1,200 pounds to the acre.

- 14 Several methods are followed in distributing the fertilizers for peanuts, and while some growers employ a one-horse distributor and sow the fertilizer where the row is to be, others scatter it broadcast and harrow it into the soil. The roots of peanuts do not spread like those of corn, and it may be more economical to apply the fertilizers to the row rather than broadcast.

PLANTING PEANUTS.

SELECTION OF SEED.

- 15 Careful selection of seed is just as important with peanuts as with any other farm or garden crop. Our best varieties have originated by selection, and it stands to reason that they may be still further improved by the same process. The best of the crop should always be saved for seed, and wherever a particularly fine plant is found it should be saved separately and the peas planted in a row to themselves, or in a small patch where they can be closely observed.
- 16 If several extra fine plants were selected and the peanuts from each saved separately, this seed might be planted in a special seed plat, a row being devoted to the product of each plant; in this way compari-

sons may be made from time to time and the best saved for further selection. The ideal plant should not only produce a large number of pods, but the pods should be well filled, uniform in size, smooth, and of bright color. The peas themselves should be plump, bright, uniform in shape, and well filled. If a grower does not have a good strain of seed, he should purchase from someone who has given the matter attention; then in future years give especial care to the matter of saving good seed.

PLANTING SHELLED OR UNSHELLED PEANUTS.

The seed of the large varieties of peanuts are practically all shelled by hand for planting. In the case of the Spanish the peas practically fill the pods, making it difficult to remove the shell by hand. The machines used in the factories for shelling peanuts break the peas more or less, and even when the peas are not broken the germination is often injured by the rough usage in shelling. For this reason it has been found safer to plant the Spanish peas in the shell almost exclusively. The shelled peas will sprout a little more quickly than those in the shells, but a few days' time will not make any material difference. If desirable, the pods may be soaked in water for a few hours before planting, in order to hasten germination.

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PLANTING MACHINERY.

The machines now upon the market for planting peanuts are constructed somewhat upon the plan of the one-horse cotton planter. These machines are well adapted to planting the shelled peas, both of the large and small varieties, and, if the peas are clean and free from stems, are quite satisfactory for planting the Spanish nuts in the shells.

18

In using the one-horse machines the land is first laid off in rows one way by means of a marker similar to that used in laying off corn rows. The planter is then run in this mark and it drops, covers, and rolls at one operation. The different distances of planting are regulated by changing a gear wheel on the machine.

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PLANTING BY HAND.

For hand dropping, furrows or marks are made with a sweep stock or single shovel just a little in advance of the droppers to prevent drying out. The seed peanuts are hauled to the field in bags, and close-woven baskets of about half-bushel size have been found desirable to drop from. The droppers simply

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View.

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take a small handful and work them between the thumb and first finger, at the same time stooping slightly in order to drop the pods at regular distances. Behind the droppers the seed is covered by means of a cultivator having the center teeth removed and a notched board placed across the rear portion, the notch coming directly over the row. The horse that draws the covering cultivator or harrow should be hitched with a side draft so that it will not walk directly upon the row.

DISTANCES TO PLANT.

The planting distances will depend upon the variety being grown; also upon the strength of the land. For the Virginia Bunch variety the usual distances are 30 to 36 inches between the rows and 10 to 12 inches in the row; for Virginia Runners the rows are placed 36 to 40 inches apart and the plants 12 to 16 inches apart in the rows. For Spanish and other similar varieties the rows are placed from 32 to 38 inches apart and the plants 8 to 12 inches apart in the rows.

DEPTH TO COVER THE SEED.

The depth to cover the seed will depend somewhat upon the compactness of the soil. If the soil is of a light sandy nature and in good condition the seed should be covered about an inch deep. Should the soil at planting time be quite dry it will be desirable to cover the seed at least $1\frac{1}{2}$ or 2 inches to insure germination.

PROTECTION OF SEED FROM ENEMIES.

After planting, seed peanuts are often molested by moles, crows, and pigeons; blackbirds are also accused of destroying the young plants just as they come through the ground. For the protection of the seed in the shell from moles it is permissible to coat the shells very lightly with pine tar thinned with kerosene. It would hardly be permissible to coat the shelled seed with tar, although a few peas might be tarred and mixed in with the regular seed. For protection against crows stretch lines of white string across the field; also scatter a few tarred peas over the surface of the ground. Pigeons are perhaps the most difficult to either frighten or repel, and the use of a shotgun is the most certain remedy. If the seed are all securely covered in planting there will not be so great danger of crows or other birds getting a start upon them.

CULTIVATION.

TOOLS REQUIRED.

View.

The tools adapted for the cultivation of peanuts are practically the same as those required for corn. Shortly after planting the peanut field may be gone over once or twice with a weeder of the King or Hallock type, or with a light harrow, to loosen the surface and destroy weeds that are starting. In using these tools very little attention need be paid to the rows; in fact, many growers prefer to go directly across the rows. Later, after the plants appear and the rows can be followed, one or two teeth can be removed from the weeder, and this type of cultivation continued until the plants are large enough for working with regular corn cultivators. A two-horse spring-tooth riding cultivator is one of the best implements for handling the peanut crop, and after the plants attain considerable size the spring teeth can be changed for the regular shovel teeth. A one-horse cultivator having five teeth is also an excellent implement, as the size of the shovels can be increased as the crop becomes larger, or hillers can be attached for working the soil toward the rows of plants.

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METHOD OF HANDLING THE CROP.

Throughout the growing of a crop of peanuts it should be the aim to keep the entire surface of the soil fine and loose, and a bed of loose soil near the plants in which the pods may form. It is scarcely necessary to add that the crop should be kept free from weeds. At the final cultivation it is considered a good practice to throw the soil well toward the plants, forming a bed, at the same time leaving a small furrow in the center of the alley to provide drainage in case of heavy rains. It is not necessary to cover the blossoms or to throw soil over the vines. Some growers follow the practice of rolling the peanuts to make the pegs go into the ground and form pods. The best method is to provide an abundance of loose earth near the plants and they will have no difficulty in plants setting pods. Care should be taken, however, that the pegs that are already rooted be not disturbed by the final cultivation. Hand hoeing may be necessary, especially during a rainy season, when the grass grows rapidly.

HARVESTING.

Peanuts are harvested by lifting the vines from the ground with the pods attached and then stacking them around small poles to cure. Proper harvesting and curing is the most

View

important part of the handling of the peanut crop. Many persons who are growing peanuts for the first time have an idea that the crop may be handled in some easier and cheaper way than by stacking, but many years of practice has shown that stacking around poles is the simplest and best method. By placing the vines and peas in the small stacks they are permitted to dry slowly and at the same time are in so small quantity that they will not become musty.

The proper time for harvesting the peanut crop is indicated by a ripening appearance of the vines. This consists of a slight yellowing of the foliage and a drooping of the stems. A few days later some of the lower leaves will begin to fall, especially if the weather is dry. To the northern limits of the peanut territory the harvesting should be done just before frost. Many beginners insist upon digging their peanut crop too early and before the peas have fully matured. It is true that there may be a pod now and then which bursts and sends forth a sprout, but the number of these are few as compared with those of later formation which are rapidly filling. Where good peanut hay is especially desirable the crop should be harvested in time to secure the best quality of vine and leaf.

LIFTING THE PEANUTS FROM THE SOIL.

- The usual custom in the older peanut sections has been to simply run a plow under the roots and lift them from the ground. Sometimes a specially designed plow is used having a share or point with a broad wing to extend beneath the plants; in other cases an ordinary plow is used, but the turning or moldboard is removed to prevent the furrow being turned, the idea being to simply loosen the plants. This practice of plowing out the crop has been responsible in a great measure for the general depletion of soil fertility throughout the peanut belt. By referring to our illustration showing the roots of the peanut plant with their great load of nitrogen-gathering bacteria, we can readily understand that if we are to maintain soil fertility these roots must be left in the soil. By the old method of plowing out the crop almost all of the roots are removed, and as they have not subsequently been returned to the soil, depletion of fertility has been the result. The proper method is to employ a tool which will cut off the greater portion of the root and leave it in the soil. In several sections the farmers have had special tools made for running under the peanut vines, and some of these are worthy of more general use.

MACHINES FOR DIGGING PEANUTS.

Some of the regular machine potato diggers have been found quite satisfactory for harvesting peanuts, but as a rule these implements have not sufficient clearance to allow a heavy growth of peanut vines to pass through. At present very much larger machines are being perfected and especially adapted to the work in the peanut fields. The machine or elevator potato diggers require about four strong mules to pull them, but may be so regulated that the sharp point of the digger will cut off the roots just below where the peanuts are formed, carry the vines with the peas attached up and over the elevator device, and deliver them on the ground behind the machine with practically all of the soil shaken from them. An outfit of this kind will dig from 8 to 12 acres daily and require about 20 hands to stack the vines behind it. In land that is weedy there is always difficulty in harvesting the crop, regardless of the kind of implement used for digging.

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METHOD OF STACKING PEANUTS TO CURE.

As already mentioned, the proper method of curing peanuts is to stack them, vines and all, around stakes set in the field where the crop is grown. Before starting to harvest the crop provide the small poles to be used as stakes around which to stack the peanuts. These stakes should be 7 feet in length by about 3 or 4 inches in diameter, and may be either split out of large logs or simply small saplings with the bark upon them. From 12 to 35 of these poles will be required for each acre, according to the stand and growth of vine; the rule, however, is about 22 stacks to the acre. Have the poles hauled and piled where they can be conveniently distributed through the peanut field when the rush of harvesting comes on.

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As a rule 11, 13, or 15 rows of peanuts are placed in a single row of stacks. The digging machine is started in the center, on the row where the stacks are to stand, and is worked outward until the necessary number of rows are lifted. After the machine has gained sufficient headway the poles are distributed at distances varying from 12 to 20 paces and set in the ground by means of a pointed bar, a peg and maul, or by a post-hole digger, and tamped in place. The stake should be set into the soil sufficiently deep to prevent the stack blowing over. On the other hand, they should not be set so deeply as to prevent their being easily lifted with the stack at thrashing time.

View.

Peanuts should not be handled when there is dew or rain upon the foliage, but, aside from this, they may be stacked within an hour or two after digging. Before starting to build the stack nail a couple of short pieces of lath at right angles across the stake about 8 inches from the ground, then simply
 31 build the stack upon these, keeping the peas or roots close
 32 around the pole and giving the outer part of the stack a down-
 ward slope to carry off the water during rains. As the stack
 is nearing completion it should be kept higher in the center
 and drawn in to a point. If convenient, the top of the stack
 may be finished with a bundle of dry grass, or a few peanut
 vines may simply be rolled together and pressed down over
 the top of the pole. Wet or green hay should never be placed
 33 on top of the stack. When completed, the stack should be
 34 about 6 feet in height and 30 inches in diameter.

LENGTH OF TIME THAT PEANUTS SHOULD REMAIN IN THE STACKS.

Once the peanut vines are in the stacks they will be comparatively safe for 5 or 6 weeks, or until they are dry enough to pick from the vines. As a rule the curing period will require at least 4 weeks, and if the peas are not molested by birds, field mice, rats, or thieves they may remain in the stacks for 3 or 4 months without injury. The crop will not be ready to pick from the vines until the stems have become brittle and the peas have attained a nutty flavor.

PICKING PEANUTS FROM THE VINES.

Formerly peanuts were all picked from the vines by hand, the work being done largely by negro women and children. Recently there have been developed several machines for
 35 doing this work. These peanut-picking machines are of two
 types, one having a cylinder like the ordinary grain thrasher,
 and in the other a picking mesh of diagonally woven wire is
 employed.

PEANUT-PICKING MACHINERY.

The essentials of a satisfactory peanut-picking machine are, first, that the pods should be picked clean from the vines without breaking or cracking the shells, and, second, that the
 36 peanuts be cleaned of all the coarser dirt and separated from
 37 the pieces of stems. There is always a small quantity of very
 fine dirt adhering to the hulls of the peanut which must be

View.

separated from them in the cleaning factory. The greatest objection to the work of peanut thrashers in the past is that they broke too many of the shells, in many cases breaking the kernels as well and rendering them unsalable. This breaking of the shells is a more serious damage than might appear at first thought, as the keeping qualities of the nuts depend upon their not becoming broken. There are a number of insects which attack peanuts while in storage, especially during the summer months, and these can not injure the kernels unless the shell is cracked or broken.

The picking of peanuts is paid for at so much per bag of about 4 bushels, 35 cents a bag being the ruling price. In some sections the owners of the picking machines do the work for every tenth bag, or where they provide a baling machine and press the peanut hay into bales they take every eighth bag, but none of the hay. Hand picking is paid for at the rate of from 40 to 50 cents a hundred pounds.

SACKING AND HANDLING PEANUTS AFTER PICKING.

As the peanuts come from the picker they are placed in sacks and either hauled direct to the cars or stored for later delivery. The standard peanut bag is about the same as the ordinary 5-bushel oat bag, and holds about 4 bushels, 90 or 92 pounds of Virginias and 110 to 120 of Spanish. As the bags are filled they are sewed and tied at the corners to facilitate handling. If the peanuts are not to be sold immediately, they are often taken from the bags and stored in bins or in slatted cribs where they will get air. The storage room should be proof against rats and mice.

The peanut vines, if properly cared for after the removal of the peas, make an excellent hay. The best plan is to have a baling press working while the thrashing or picking is being done and press the vines into moderate-size bales.

The peanut-picking machines break the hay considerably, but by careful handling in baling the leaves and stems can be worked into the bales together in the proper proportions. The feeding value of peanut hay renders it worth while to take special precautions in curing and handling it. One important point in curing peanut hay is to get the vines into the small stacks soon after digging them; also to avoid having the hay become wet by rains.

VARIETIES OF PEANUTS.

Vito.

- At present about five varieties of peanuts are grown in the United States, these being known as Virginia Runner, Virginia
- 43 Bunch, African (or North Carolina), Spanish, and Valencia, commonly known as Tennessee Red. The Virginia Runner and
- 44 Bunch produce peas that are practically alike, these being the Jumbo or parching peanuts of our markets. The African, or North Carolina, as it has come to be called in this country, has a spreading vine and produces a medium-size pea, which is used for shelling purposes and for the smaller grades of parching stock. The Spanish variety is the small peanut, with only two peas
- 45 in a pod, which is used so extensively for the manufacture of salted peanuts, peanut butter, etc. The Spanish has an upright or bunch habit of growth, with the peanuts clustered about the base of the plant. The Valencia, or Tennessee Red variety, has rather large and sometimes very long pods, with anywhere from two to seven small red peas crowded together in the pods. The Valencia is in demand for use in the manufacture of salted peanuts and peanut butter. A form of the Valencia known as Georgia Red or Red Spanish is extensively grown for hog and cattle feeding in parts of the Southern States. However, this variety is not desirable for the market. For the present, the true Spanish, or white Spanish as it is sometimes called, is the proper variety to grow throughout the Southwestern States, as it is easy of cultivation and contains a high percentage of oil.

MARKETING OF PEANUTS.

The peanuts as they come from the picking machine on the farm are generally bagged, and either hauled direct to the cars or stored for a short time in barns or sheds until they can be shipped. It should be the aim of every grower to have his crop go into the bags in just as clean a condition as possible, free from stones, sticks, dirt, and pieces of stems. Where the peanuts are not properly cleaned the buyers are compelled to dock the weights, and this always results in dissatisfaction to both parties. If the peas are not clean as they come from the thrasher they should be run through a fanning mill to blow out the dirt, and afterwards picked over by hand if necessary.

- 46 Peanuts are comparatively light to handle and can be transported considerable distances, and it is not necessary to have a factory in every section where peanuts are grown. As a rule the buyers from the factories come to the various shipping

points to inspect, purchase, and load the peanuts into cars as they are hauled in by the farmers. Another method is where the factory is represented in a town by a merchant who buys the peanuts from the farmers and stores them until wanted for shipment to the factory.

WEIGHT OF PEANUTS.

The unit in handling peanuts is the pound rather than the bushel or bag. The large Virginia peanuts weigh about 22 pounds to the measured bushel, while the Spanish weigh about 30 pounds to the bushel. Two and one-half cents a pound for farmers' stock would mean about 75 cents a bushel for Spanish, while $3\frac{1}{2}$ cents a pound, or 77 cents a bushel, would be the ruling price for Virginias. By using the pound as the unit in buying and selling peanuts the troublesome question of weight per bushel will be avoided. Peanuts grown in one section may weigh more to the bushel than those grown in another or even an adjoining territory.

THE CLEANING FACTORY PROCESS.

In the factory the peanuts are fanned and polished to remove the dirt, and are separated into a number of different grades. During the process they are all carefully picked over by hand and cleaned until the finished products would scarcely be recognized as coming from the rough stock that was shipped in by the farmer. All of the shelled or broken peas must be separated from the whole ones and worked into shelled stock of various grades.

In the factories where the Spanish are handled the process is not so complicated, yet even here there is the same careful hand picking to remove inferior peas and refuse not taken out by the cleaning machinery. The peas are passed over a fan, then are shelled and the hulls blown out. Next the peas are run through a machine which separates the split or broken peas from the whole ones. The different grades are then run on what are termed picking belts beside which a large number of women are seated and pick out every inferior pea or particle of foreign matter. The refuse from a peanut factory often contains practically every waste or cast-off article that may be found on a farm. After the cleaning process is completed the peanuts are bagged in clean, new burlap bags and marked with a stencil showing the brand, grade, and name of the cleaner.

USES OF PEANUTS.

USES OF PEANUTS AS FOOD.

View.

Peanuts now find uses in a great many ways aside from being roasted and sold in packages. There is a great and ever-increasing demand for peanuts to be used in the preparation of salted peanuts, peanut butter, peanut candies, peanut flour, and vegetarian meat substitutes. Owing to the high nutritive properties of peanuts they are rapidly assuming an important place as a standard human food, ranking in this respect with other legumes which they resemble in composition. The consumption of peanut butter alone amounts to hundreds of carloads of the product annually.

PRODUCTION OF OIL FROM PEANUTS.

In France and Germany millions of bushels of peanuts are annually crushed for oil, the oil being used for cooking, for salad making, and in the place of butter, while the cake resulting from the manufacture of the oil is used as stock food. In this country we have many oil mills that are either idle or running on short time on account of the shortage of cottonseed, and it is only a matter of a little time until our production of peanuts will enable us to build up a great industry in the manufacture of peanut oil. In general the oil from the peanut has the same culinary and table uses as olive oil, cottonseed oil, and some other vegetable oils, and, like them, is considered a wholesome and valuable food product. Thirty pounds, or a bushel, of Spanish peanuts will yield 1 gallon of oil and about 20 pounds of cake. A gallon of this oil is worth 75 cents wholesale and the cake is worth 1½ cents a pound, or 25 cents, making a total of \$1 from a bushel, from which the working cost must be taken. Assuming that an average of 40 bushels of Spanish peanuts can be grown to an acre, we have a very promising proposition in the manufacture of peanut oil, especially when the peanut hay will almost pay the cost of growing the crop.

VALUE OF PEANUTS AS STOCK FOOD.

- 48 All of the inferior or refuse peanuts can be used to advantage on the farm for feeding to hogs and also to the general farm animals. There is not a pound of the entire peanut crop, including roots, stems, leaves, and peas, but that has some value, and not an ounce should be wasted. The tops when
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used as hay have a feeding value equal to the best clover, alfalfa, and cowpea hays; in fact, peanut hay is one of the best of dairy feeds for milk production. As a result of the handling of peanuts in the cleaning factories there are quantities of finely broken and shriveled peas that are sold for hog feed, and sometimes ground into meal and sold for feeding to cows. The cake resulting from the manufacture of peanut oil is equal to the best cottonseed meal for feeding purposes.

COST OF GROWING PEANUTS AND RETURNS.

The total average cost of growing an acre of peanuts in the Southern States is about \$12 where no commercial fertilizers are used. Add to this the cost of 200 to 300 pounds of fertilizer and the total will not exceed \$16 an acre. On a block of land consisting of 54 acres in northern Louisiana during the season of 1910 the itemized cost per acre of production was as follows: Plowing and fitting the land, seed, and planting, \$5.35; cultivation, \$2.80; harvesting and stacking, including the cutting and hauling of poles, \$3.87; thrashing and hauling to car, \$4.80; bags and twine, \$1.05; total cost, \$17.87. This land produced an average yield of 60 bushels to an acre and 1 ton of hay. The peanuts sold for \$1 a bushel of 30 pounds and the hay for \$12 a ton, making a total return of \$72 an acre. Deducting the cost of growing, which included the foreman's time, the grower received a net return of about \$54 an acre, or \$2,916 from the 54 acres.

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Doubtless a great many more peanuts will be grown in the future than in the past, but the demand is also increasing and there is money to be made so long as the price for Spanish peanuts remains above 2½ cents a pound for farmer's stock. There is great interest in hog raising throughout the Southern States, and peanuts are a valuable adjunct to corn for the production of high-grade hams and bacon.

APPENDIX.

LANTERN SLIDES.

No. of
view.

1. General view of peanut field about the middle of summer.
2. Map of United States, darkened portion indicating the area naturally adapted to the growing of peanuts.
3. Portion of peanut plant, showing the flower and the little pegs that enter the soil and form the pods.
4. The peanut's way of showing its gratitude to the soil.
Roots of peanut plant covered with nitrogen-gathering nodules.
5. Crop rotation plan for a peanut farm in the Virginia-Carolina district.
6. Crop rotation plan for growing peanuts in southern districts.
7. Type of disk plow adapted to fitting loose sandy lands for peanuts.
8. Acme harrow, a type of tool adapted for preparing the soil for peanuts.
9. Showing the quantity of plant food removed where the entire root system of the peanut is taken from the soil.
By proper methods of harvesting the greater portion of this nitrogen, which amounts to \$16 an acre, will be left in the soil.
10. On soils containing an abundance of potash this portion of the fertilizer can be eliminated.
11. Soil improvement.
Field of corn without the addition of cowpeas
12. Soil improvement.
Field of corn with cowpeas growing in the rows. A suitable cropping system to be followed the year preceding peanuts.
13. Manure spreader used for scattering lime on peanut field.
14. One-horse fertilizer drill used for sowing fertilizer for peanuts.
The ordinary cotton fertilizer drill can also be used for this purpose.
15. Improvement of peanut varieties by seed selection.
Rows of peanuts planted from the product of individual plants.
16. Improvement of peanut varieties by seed selection.
Weeding out unproductive plants in the seed patch.
17. Scene in a Virginia peanut field during planting time.
18. View of one-horse peanut planter.
19. Peanut-planting machine in operation.
20. Dropping peanuts by hand in a small furrow opened by a single-shovel plow.
21. Covering peanuts with a one-horse cultivator after dropping them by hand.
22. Five-tooth, one-horse cultivator adapted to all phases of peanut cultivation.
23. Old method of harvesting peanuts by plowing them from the soil.
24. Plow type of peanut digger.
25. Roots of peanut plant.
In digging, the roots should be cut at a point that will leave the major portion of the root system in the soil.

No. of
view.

26. { A good type of peanut digger.
27. { Georgia stock, underneath which is mounted a U-shaped bar, which is so arranged that it will cut off the roots of the peas and lift the plants from the ground. The cost of this machine is about \$6.
28. Machine potato digger adapted for digging peanuts.
29. Machine potato digger being used for digging peanuts
30. Stacking peanuts to cure.
Stake around which to build stack.
31. Stacking peanuts to cure.
The stack partially constructed, with one layer of vines around the pole, all of the peas to the center, and the stack high in the middle.
32. Stacking peanuts.
Showing the various operations from the carrying of the vines with the seed fork, the beginning of the stack, and the finishing of the stack, together with completed stacks in the background.
33. A poorly built peanut stack, with a large number of the peanuts exposed to the weather and the ravages of birds.
34. A properly built peanut stack, with all of the peas to the center.
35. Picking peanuts by hand in a Virginia peanut field.
36. Picking peanuts from the vines by means of machinery.
37. Another type of peanut picker.
38. Peanut picker fitted for driving with horsepower.
This machine is also made for applied or engine power.
39. Common type of peanut picker used for picking Spanish peanuts.
40. Device installed in some of the peanut-picking machines for the removal of the little stems from the pods.
This consists of a set of gin saws operated between horizontal iron bars.
41. One-horse device sometimes used for hauling peanut stacks to the thrasher.
42. Type of bag used for handling peanuts.
This bag holds approximately 4 bushels or about 90 pounds of the Jumbo or Virginia peas, or 110 to 120 of the Spanish peas.
43. Three leading types of peanuts.
44. Plant and nuts of the Virginia Bunch or Jumbo pea.
45. Plant and nuts of the Spanish.
46. Marketing of peanuts.
Great quantities of peanuts are handled during the shipping season in the Virginia-Carolina district. Steamer loaded with bags of peanuts.
47. A modern peanut warehouse and cleaning factory.
48. Value of peanut hay as compared with other hays.
49. Value of peanut waste products.
This includes small or broken parts of kernels and peanut meal as compared with cottonseed meal, corn meal, and wheat bran.
50. Peanuts planted in the alleys between rows of corn.
This is a practice often followed in Georgia, where many thousands of acres of peanuts are grown in this way, the corn rows being about 5 feet apart and the peanuts planted in a small bed in the center at the time of laying by the corn. The crop is sometimes harvested, but more often fed to the hogs in the field.

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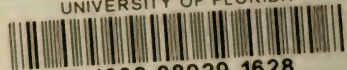
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